

Appl. No. 10/517,030
Amdt dated June 21, 2006
Reply to Office Action dated March 15, 2006

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (currently amended) A hydraulic stepless transmission comprising a first hydraulic system that has a first plunger and a swash plate, which the first plunger abuts on, a second hydraulic system that has a second plunger and a swash plate, which the second plunger abuts on, and a cylinder block, wherein formed in the cylinder block are first and second plunger holes that contain the first and second plungers, respectively, a hydraulic closed circuit that connects the first and second plunger holes, and a distributing valve hole that contains a distributing valve for switching flow direction of hydraulic fluid in the hydraulic closed circuit, a shaft is provided that extends through the cylinder block, the shaft and the cylinder block synchronously rotate, the first and second plunger holes are formed in parallel to the shaft, respectively, and the swash plate of the second hydraulic system is rotatably supported around the shaft, and the shaft is supported by a combined thrust and radial bearing and a radial bearing on each side ~~both sides~~ of the cylinder block, ~~respectively~~

wherein the combined thrust and radial bearing and the radial bearing on each side of the cylinder block are supported by a single member.

2. (canceled)

3. (previously presented) The hydraulic stepless transmission according to claim 1, wherein the distributing valve hole is located in parallel to the shaft and is closer to the shaft than the first and second plunger holes; and

wherein an oil passage that connects the plunger hole and the distributing valve hole is formed in said cylinder block in a radial direction.

4. (previously presented) The hydraulic stepless transmission according to claim 1,

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wherein the distributing valve hole is formed in parallel to the shaft so as to extend through the cylinder block.

5. (previously presented) The hydraulic stepless transmission according to claim 1, further comprising a high pressure oil chamber and a low pressure oil chamber juxtaposed along an axial direction in the cylinder block so as to be closer to the shaft than the first and second plunger holes;

wherein a spline section is formed in the shaft, and the shaft is fit into the cylinder block at the spline section; and

wherein the low-pressure oil chamber communicates with the spline section of the shaft.

6. (previously presented) The hydraulic stepless transmission according to claim 1, wherein an outer circumferential surface of the swash plate of the second hydraulic system is formed through machining by using a first machining central axis, which is a line perpendicular to a swash plate surface of this swash plate, a machining central axis, which is a center line of the shaft, and a second machining central axis, which is a line that is parallel to a center line of the shaft and is offset to a side where a gap narrows between the swash plate surface and a surface opposite to the swash plate surface.

7. (currently amended) A power transmission comprising:

a hydraulic stepless transmission including a first hydraulic system that has a first plunger and a swash plate, which the first plunger abuts on, and a second hydraulic system that has a second plunger and a swash plate, which the second plunger abuts on, and a cylinder block, wherein formed in the cylinder block are first and second plunger holes that contain the first and second plungers, respectively, a hydraulic closed circuit that connects the first and second plunger holes, a distributing valve hole that contains a distributing valve for switching flow direction of hydraulic fluid in the hydraulic closed circuit, a shaft is provided that extends through the cylinder block, the shaft and the cylinder block synchronously rotate, the first and second plunger holes are formed in parallel to the shaft, respectively, and the swash plate of the second hydraulic system is rotatably supported around the shaft, and the shaft is supported by a

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combined thrust and radial bearing and a radial bearing on each side ~~both sides~~ of the cylinder block, respectively wherein the combined thrust and radial bearing and the radial bearing on each side of the cylinder block are supported by a single member;

a device which transmits or shuts down power to the shaft; and

a device which inputs turning force from the swash plate of the second hydraulic system and outputs rotation in a direction identical or reverse to that of the swash plate of the second hydraulic system.

8. (canceled)

9. (previously presented) The hydraulic stepless transmission according to claim 7, wherein the distributing valve hole is located in parallel to the shaft and is closer to the shaft than the first and second plunger holes, and an oil passage is disposed in said cylinder block in a radial direction connecting the plunger hole and the distributing valve hole.

10. (previously presented) The hydraulic stepless transmission according to claim 7, wherein the distributing valve hole is formed in parallel to the shaft so as to extend through the cylinder block.

11. (currently amended) The hydraulic stepless transmission according to claim 7, further comprising a high pressure oil chamber and a low pressure oil chamber juxtaposed along an axial direction in the cylinder block so as to be closer to the shaft than the first and second plunger holes, wherein ~~where~~ a spline section is formed in the shaft, with the shaft fit into the cylinder block at the spline section, and the low-pressure oil chamber communicates with the spline section of the shaft.

12. (previously presented) The hydraulic stepless transmission according to claim 7, wherein an outer circumferential surface of the swash plate of the second hydraulic system is formed through machining by using a first machining central axis, which is a line perpendicular to a swash plate surface of this swash plate, a machining central axis, which is a center line of the

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shaft, and a second machining central axis, which is a line that is parallel to a center line of the shaft and is offset to a side where a gap narrows between the swash plate surface and a surface opposite to the swash plate surface.

13. (currently amended) A hydraulic stepless transmission comprising:
a first hydraulic system including a first plunger and a swash plate, which the first plunger abuts on;
a second hydraulic system including a second plunger and a swash plate, which the second plunger abuts on;
a cylinder block including:
first and second plunger holes containing the first and second plungers;
a hydraulic closed circuit that connects the first and second plunger holes; and
a distributing valve hole containing a distributing valve for switching flow direction of hydraulic fluid in the hydraulic closed circuit;
a shaft extending through the cylinder block, in which the shaft and the cylinder block synchronously rotate, the first and second plunger holes are formed parallel to the shaft, and the swash plate of the second hydraulic system is rotatably supported around the shaft, with bearings means provided for supporting the shaft on each side both sides of the cylinder block, wherein the bearings on each side of the cylinder block are supported by a single member.

14. (canceled)

15. (previously presented) The hydraulic stepless transmission according to claim 13, wherein the distributing valve hole is located in parallel to the shaft and is closer to the shaft than the first and second plunger holes, and an oil passage in said cylinder block extends in a radial direction and connects the plunger hole and the distributing valve hole.

16. (previously presented) The hydraulic stepless transmission according to claim 13, wherein the distributing valve hole is formed parallel to the shaft so as to extend through the cylinder block.

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17. (previously presented) The hydraulic stepless transmission according to claim 13, further comprising a high pressure oil chamber and a low pressure oil chamber juxtaposed along an axial direction in the cylinder block so as to be closer to the shaft than the first and second plunger holes, wherein a spline section is formed in the shaft, and the shaft is fit into the cylinder block at the spline section, and the low-pressure oil chamber communicates with the spline section of the shaft.

18. (previously presented) The hydraulic stepless transmission according to claim 13, wherein an outer circumferential surface of the swash plate of the second hydraulic system is formed through machining by using a first machining central axis, which is a line perpendicular to a swash plate surface of this swash plate, a machining central axis, which is a center line of the shaft, and a second machining central axis, which is a line that is parallel to a center line of the shaft and is offset to a side where a gap narrows between the swash plate surface and a surface opposite to the swash plate surface.